

CLAIMS

1. (currently amended) A network element [[(1)]] for setting up wireless networks [[(3)]] for wireless data exchange between network elements [[(1)]] and/or network users [[(2)]], wherein the network element [[(1)]] has a transmitting/receiving unit [[(12)]] for wirelessly transmitting and receiving data, a control unit [[(11)]] for controlling the processing of data and a data memory [[(15)]].

characterized in that the control unit [[(11)]] is adapted to evaluate connection path information [[(22)]] and connection state information [[(21)]] for data exchange between network elements [[(1)]] and/or network users [[(2)]] in order to determine partial sections of data transmission routes and/or complete data transmission routes for transmitting or forwarding data, wherein the connection path information [[(22)]] specifies the number of the network elements [[(1)]] and the neighborhood relationships of the network elements [[(1)]] of the network and the connection state information [[(21)]] specifies the state of the connection between network elements [[(1)]] and/or network users [[(2)]].

2. (currently amended) A network element as set forth in claim 1

characterized in that the control unit [[(11)]] is adapted to evaluate connection state information [[(21)]] and connection path information [[(22)]] stored in the data memory [[(15)]] and/or connection state information [[(21)]] and connection path information [[(22)]] contained in the data intended for the data exchange.

3. (currently amended) A network element as set forth in claim 1 or ~~claim 2~~

characterized in that the connection path information [[(22)]] stored in the data memory [[(15)]] specifies the number of the network elements [[(1)]] and the neighborhood relationships of the network elements [[(1)]] of the entire network [[(3)]] and the connection state information [[(21)]] specifies the state of the connection between network elements [[(1)]] and/or network users [[(2)]] of the entire network [[(3)]].

4. (currently amended) A network element as set forth in ~~one of the preceding claims~~ claim 1

characterized in that the data memory [[(15)]] is adapted for storage of an item of authentication information [[(23)]] which is present only a single time for each network element [[(1)]] and the control unit [[(11)]] is adapted to transmit the authentication information [[(23)]] by means of the transmitting/receiving units [[(12)]] to other network elements [[(1)]] and to evaluate the items of authentication information [[(23)]] received from other network elements [[(1)]] for checking the entitlement of the other network elements [[(1)]] of the network for data exchange in the network [[(3)]].

5. (currently amended) A network element as set forth in ~~one of the preceding claims~~claim 1

characterized in that the data memory [[(15)]] is adapted for the storage of an item of authorization information [[(24)]] which is unique in the network, in particular an item of address information, which is characterizing in respect of each network user [[(2)]] and each network element [[(1)]] in the network, and the control unit [[(11)]] is adapted to transmit the authorization information [[(24)]] by means of the transmitting/receiving units [[(12)]] to other network elements [[(1)]] and to evaluate the authorization information [[(24)]] received from other network elements [[(1)]] to determine at least partial sections of data transmission routes in the network [[(3)]].

6. (currently amended) A network element as set forth in ~~one of the preceding claims~~claim 1

characterized by a first transmitting/receiving unit [[(12)]] for the data exchange of network elements [[(1)]] with each other and a second transmitting/receiving unit [[(12)]] for data exchange between network elements [[(1)]] and network users [[(2)]].

7. (currently amended) A network element as set forth in ~~one of the preceding claims~~claim 1

characterized by coupling means (202, 203) for coupling the network element [[(1)]] for data exchange with a second network [[(4)]], in particular a non-wireless infrastructure network like the Internet.

8. (currently amended) A network element as set forth in ~~one of the preceding claims~~claim 1

characterized by coupling means [[(204)]] for coupling of the network element [[(1)]] to a plurality of different energy sources, in particular solar cells.

9. (currently amended) A network element as set forth in claim 7 characterized in that the coupling means (202, 203) for data exchange are adapted also to supply the network element [[(1)]] with energy by means of the coupling means (202, 203) for data exchange, in particular by means of an Ethernet connection [[(202)]] for a non-wireless infrastructure network [[(4)]].

10. (currently amended) A network element as set forth in one of the preceding claims claim 1

characterized by at least one transmitting/receiving unit [[(12)]] in accordance with one or more of the standards IEEE 802.11a, IEEE 802.11b and IEEE 802.11g.

11. (currently amended) A network element as set forth in one of the preceding claims claim 1

characterized in that it has one or more WLAN PCI-cards [[(300)]] in accordance with one or more of the standards IEEE 802.11a, IEEE 802.11b and IEEE 802.11g, volatile and non-volatile memories (103, 105), in particular SDRAMs or flash memories, a microprocessor or microcomputer unit and/or programmable logic components (100, 101, 102), for regulating and controlling power loss and the energy sources and two antennae respectively for data of network users [[(2)]] and network elements[[(1)]].

12. (currently amended) A method of setting up wireless networks [[(3)]] for data exchange between network elements [[(1)]] and/or network users [[(2)]] comprising the steps:

- exchanging and storing connection path information [[(22)]] and connection state information [[(21)]] of the network elements [[(1)]] relative to each other and of the network users [[(2)]] relative to the network elements[[(1)]],
- evaluating the connection path information [[(22)]] and connection state information[[(21)]],
- exchanging data between network elements [[(1)]] and/or network users [[(2)]] based on the items of connection path information [[(22)]] and items of connection state information[[(21)]], by dispatching data through a first network user

[[(2)]] to a network element [[(1)]] arranged in the proximity, and

- receiving the data through the network element [[(1)]] and further dispatching the data in relation to an adjacent network element [[(1)]] in a direction towards the addressed second network user [[(2)]] or the addressed network user [[(2)]] itself by way of a data transmission route ascertained (21, 22) from the connection state and connection path information or a partial section of a data transmission route.

13. (currently amended) A method as set forth in claim 12 characterized by finding network elements [[(1)]] and network users [[(2)]] by wirelessly receiving and emitting connection enquiries.

14. (currently amended) A method as set forth in claim 12 ~~or claim 13~~ characterized by checking the authenticity of the found network elements [[(1)]] by evaluation of a sent item of authenticity information [[(12)]] for ascertaining the entitlement for data exchange and storage of the entitlement information ascertained therefrom.

15. (currently amended) A method as set forth in ~~one of claims 12 and~~ claim 12

characterized by the steps of transmitting, receiving, allocating and storing in the network unique authorization information[[(24)]], in particular address information of network elements [[(1)]] and network users[[(2)]].

16. (currently amended) A method as set forth in claim 15 characterized by handing over network users [[(2)]] from the transmitting/receiving region [[(7)]] of a first network element [[(1)]] into the transmitting/receiving region [[(7)]] of a second network element [[(1)]] in dependence on the connection state information [[(21)]] and the connection path information [[(22)]] while retaining the unique authorization information [[(24)]] associated with the network user[[(2)]].

17. (currently amended) A method as set forth in ~~one of claims 12 through~~ claim 12

characterized by adding network element [[(1)]] to the transmitting/receiving region [[(7)]] of network elements [[(1)]] already arranged in the network[[(3)]].

18. (currently amended) A method as set forth in ~~one of claims 12 through 17~~claim 12

characterized by distinguishing and separating the wireless data exchange in accordance with network users [[(3)]] and network elements[[(1)]], in particular by using different frequency ranges, allotting frequency channels, time multiplexing and/or different modulation methods and/or standards of wireless data transmission for data exchange between network users [[(2)]] and data exchange only between network elements[[(1)]].

19. (currently amended) A method as set forth in ~~one of claims 12 through 18~~claim 18

characterized by coupling a plurality of network elements [[(1)]] to a second network[[(4)]], in particular a non-wireless infrastructure network like the Internet.

20. (currently amended) A method as set forth in ~~one of claims 12 through 19~~claim 12

characterized by

- provision of a predefined limited number of items of authorization information (24) for network users[[(2)]], which is the same in all network elements [[(1)]].
- the detection of an association event by a network element[[(1)]], which indicates that a network user [[(2)]] is within the transmission/reception range of a network element[[(1)]].
- comparison of the communicated authorization information (24) with the predefined known items of authorization information[[(24)]].
- evaluation of the comparison to ascertain whether this is an external network user (2) or a network user who is already known,
- assignment of an item of authorization information [[(24)]] when an external network user [[(2)]] has been ascertained,

- communicating the connection path and/or connection state information (21, 22)-related to the network user [[(2)]] to the network elements [[(1)]] of the network, and
- communicating an item of authorization information to the network user, which is characteristic of the network, in particular address information for data transmission.

21. (currently amended) A network having network elements [[(1)]] as set forth in ~~one of claims 1 through 14~~claim 1 for setting up wireless networks [[(3)]] for network users [[(2)]] according to a method as set forth in one of claims 12 through 19, wherein the data exchange between two or more network users [[(2)]] is always effected at least by means of a network element [[(1)]] and on the basis of the connection state and the connection path information (21, 22).

22. (currently amended) A network as set forth in claim 21 characterized in that the spatial distance of the network elements [[(1)]] is substantially less than the range of the transmitting/receiving units (12, 7)-of the network elements.

23. (currently amended) A network as set forth in ~~one of claims 21 and 22~~claim 21

characterized in that inter-related data can be stored distributedly in the data memories [[(15)]] of a plurality of network elements[[(1)]].